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(Item 1 from file: 123)

3012828

Status Changes:

REISSUE REQUESTED

Assignee:
Zenon Environmental Inc CA

Patent	Issue
Number	Date

Patent:
US 5783083

19980721

Reissue Requested:

Request	Request	Recorded	Exam.	Reissue
Number	Date	in OG	Group	Patent No.

09/621234 20000720 20000912 1723

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☐ 2.

1/5/2

(Item 1 from file: 345)

15174533

Basic Patent (No,Kind,Date): WO 9706880 A2 19970227

PATENT FAMILY:

AUSTRALIA (AU)

Patent (No,Kind,Date): AU 9666528 A1 19970312

VERTICAL SKEIN OF HOLLOW FIBER MEMBRANES AND METHOD OF MAINTAINING CLEA
FIBER SURFACES (English)

8/30/01 1:06 PM

Patent Assignee: ZENON ENVIRONMENTAL INC
Author (Inventor): MAHENDRAN MAILVAGANAM; PEDERSEN STEVEN KRISTIAN; HENSHA
WAYNE JERALD; BEHMANN HENRY; RODRIGUES CARLOS FERNANDO F
Priority (No,Kind,Date): WO 96CA536 W 19960808; US 514119 A 19950811
US 690045 A 19960731
Applic (No,Kind,Date): AU 9666528 A 19960808
IPC: * B01D-053/62
Derwent WPI Acc No: * C 97-165077

Language of Document: English
Patent (No,Kind,Date): AU 9914308 A1 19990628
SYSTEM FOR MAINTAINING A CLEAN SKEIN OF HOLLOW FIBRES WHILE FILTERIN
SUSPENDED SOLIDS (English)

Patent Assignee: ZENON ENVIRONMENTAL INC
Author (Inventor): PEDERSEN STEVEN KRISTIAN; BEHMANN HENRY
Priority (No,Kind,Date): WO 98CA1115 W 19981202; US 67724 P 19971208
US 24417 A 19980217

Applic (No,Kind,Date): AU 9914308 A 19981202
IPC: * B01D-061/18; B01D-063/02; B01D-063/04; B01D-065/02; B01D-065/08
Language of Document: English
Patent (No,Kind,Date): AU 715364 B2 20000203
VERTICAL SKEIN OF HOLLOW FIBER MEMBRANES AND METHOD OF MAINTAINING CLEA
FIBER SURFACES (English)

Patent Assignee: ZENON ENVIRONMENTAL INC
Author (Inventor): MAHENDRAN MAILVAGANAM; PEDERSEN STEVEN KRISTIAN; HENSHA
WAYNE JERALD; BEHMANN HENRY; RODRIGUES CARLOS FERNANDO F
Priority (No,Kind,Date): WO 96CA536 W 19960808; US 514119 A 19950811
US 690045 A 19960731

Applic (No,Kind,Date): AU 9666528 A 19960808
IPC: * B01D-053/62
Derwent WPI Acc No: * C 97-165077; C 99-356790
Language of Document: English

EUROPEAN PATENT OFFICE (EP)

Patent (No,Kind,Date): EP 1053054 A1 20001122
SYSTEM FOR MAINTAINING A CLEAN SKEIN OF HOLLOW FIBRES WHILE FILTERIN
SUSPENDED SOLIDS (English; French; German)

Patent Assignee: ZENON ENVIRONMENTAL INC (CA)
Author (Inventor): PEDERSEN STEVEN KRISTIAN (CA); BEHMANN HENRY (CA)
Priority (No,Kind,Date): WO 98CA1115 W 19981202; US 67724 P 19971208
US 24417 A 19980217

Applic (No,Kind,Date): EP 98958129 A 19981202
Designated States: (National) DE; FR; GB; IT; NL
IPC: * B01D-061/18; B01D-063/02; B01D-063/04; B01D-065/02; B01D-065/08
CA Abstract No: * 131(02)022926G
Derwent WPI Acc No: * C 99-371296
Language of Document: English

Patent (No,Kind,Date): EP 846023 A2 19980610
VERTICAL SKEIN OF HOLLOW FIBER MEMBRANES AND METHOD OF MAINTAINING CLEA
FIBER SURFACES (English; French; German)

Patent Assignee: ZENON ENVIRONMENTAL INC (CA)
Author (Inventor): MAHENDRAN MAILVAGANAM (CA); PEDERSEN STEVEN KRISTIAN
(CA); HENSHAW WAYNE JERALD (CA); BEHMANN HENRY (CA); RODRIGUES CARLO
FERNANDO F (CA)

Priority (No,Kind,Date): WO 96CA536 W 19960808; US 514119 A 19950811
US 690045 A 19960731
Applic (No,Kind,Date): EP 96926288 A 19960808
Designated States: (National) DE; FR; GB; IT; NL
IPC: * B01D-063/02
Derwent WPI Acc No: * C 97-165077
Language of Document: English

UNITED STATES OF AMERICA (US)

Patent (No,Kind,Date): US 5639373 A 19970617
VERTICAL SKEIN OF HOLLOW FIBER MEMBRANES AND METHOD OF MAINTAINING CLEAN
FIBER SURFACES WHILE FILTERING A SUBSTRATE TO WITHDRAW A PERMEATE
(English)

Patent Assignee: ZENON ENVIRONMENTAL INC (CA)
Author (Inventor): MAHENDRAN MAILVAGANAM (CA); RODRIGUES CARLOS FERNANDO (CA); PEDERSEN STEVEN KRISTIAN (CA)
Priority (No,Kind,Date): US 514119 A 19950811
Applic (No,Kind,Date): US 514119 A 19950811
National Class: * 210636000; 210034690; 210356000; 210500230
IPC: * B01D-065/02
Derwent WPI Acc No: * C 97-165077
Language of Document: English
Patent (No,Kind,Date): US 5783083 A 19980721
VERTICAL CYLINDRICAL SKEIN OF HOLLOW FIBER MEMBRANES AND METHOD OF MAINTAINING CLEAN FIBER SURFACES (English)
Patent Assignee: ZENON ENVIRONMENTAL INC (CA)
Author (Inventor): HENSHAW WAYNE JERALD (CA); MAHENDRAN MAILVAGANAM (CA); BEHMANN HENRY (CA)
Priority (No,Kind,Date): US 690045 A 19960731; US 514119 A2 19950811
Applic (No,Kind,Date): US 690045 A 19960731
Addnl Info: 5639373 Patented
National Class: * 210636000; 210500230; 210650000; 210321690; 210356000; 210321800; 210321890; 210257200
IPC: * B01D-061/00
Derwent WPI Acc No: * C 97-165077
Language of Document: English
Patent (No,Kind,Date): US 5910250 A 19990608
BAFFLE FOR CONVERSION OF FINE BUBBLES TO COARSE WHILE FILTERING WITH A VERTICAL SKEIN OF HOLLOW FIBERS (English)
Patent Assignee: ZENON ENVIRONMENTAL INC (CA)
Author (Inventor): MAHENDRAN MAILVAGANAM (CA); DEUTSCHMANN AKE ADOLF (CA); HENSHAW WAYNE JERALD (CA); BEHMANN HENRY (CA)
Priority (No,Kind,Date): US 896517 A 19970616; US 514119 A2 19950811; US 690045 A2 19960731
Applic (No,Kind,Date): US 896517 A 19970616
Addnl Info: 5639373 Patented; 5783083 Patented
National Class: * 210636000; 210650000; 210321690; 210321890; 210321800; 210220000
IPC: * B01D-061/00; C02F-001/44
Derwent WPI Acc No: * C 97-165077; C 99-356790; C 00-282502; C 99-356790
Language of Document: English
Patent (No,Kind,Date): US 5944997 A 19990831
SYSTEM FOR MAINTAINING A CLEAN SKEIN OF HOLLOW FIBERS WHILE FILTERING SUSPENDED SOLIDS (English)
Patent Assignee: ZENON ENVIRONMENTAL INC (CA)
Author (Inventor): PEDERSEN STEVEN KRISTIAN (CA); BEHMANN HENRY (CA)
Priority (No,Kind,Date): US 24417 A 19980217; US 690045 A2 19960731; US 514119 A2 19950811; US 67724 P 19971208
Applic (No,Kind,Date): US 24417 A 19980217
Addnl Info: 5783083 Patented; 5639373 Patented
National Class: * 210636000; 210321690; 210321790; 210321890; 210257200; 210195200; 210650000; 261126000; 261DIG070
IPC: * B01D-063/00; B01D-061/00
CA Abstract No: * 131(02)022926G
Derwent WPI Acc No: * C 97-165077; C 99-356790; C 99-371296
Language of Document: English
Patent (No,Kind,Date): US 6042677 A 20000328
POTTED HEADER FOR HOLLOW FIBER MEMBRANES AND METHOD FOR MAKING IT (English)
Patent Assignee: ZENON ENVIRONMENTAL INC (CA)
Author (Inventor): MAHENDRAN MAILVAGANAM (CA); DEUTSCHMANN AKE ADOLF (CA); HENSHAW WAYNE JERALD (CA); BEHMANN HENRY (CA)
Priority (No,Kind,Date): US 258999 A 19990226; US 896517 A3 19970616; US 514119 A1 19950811; US 690045 A2 19960731
Applic (No,Kind,Date): US 258999 A 19990226
Addnl Info: 5910250 Patented; 5639373 Patented
National Class: * 156242000; 156245000; 156246000; 156145000; 264DIG048; 210321780; 210321800; 210321900; 210321880; 210321890; 210500230

IPC: * B01D-063/00; B29B-001/165
Derwent WPI Acc No: * C 97-165077; C 99-356790; C 00-282502; C
00-282502
Language of Document: English
Patent (No,Kind,Date): US 6193890 BA 20010227
SYSTEM FOR MAINTAINING A CLEAN SKEIN OF HOLLOW FIBERS WHILE FILTERING
SUSPENDED SOLIDS (English)
Patent Assignee: ZENON ENVIRONMENTAL INC (US)
Author (Inventor): PEDERSEN STEVEN KRISTIAN (CA); BEHMANN HENRY (CA)
Priority (No,Kind,Date): US 386575 A 19990830; US 24417 A2 19980217;
US 690045 A2 19960731; US 514119 A2 19950811; US 67724 P 19971208
Applic (No,Kind,Date): US 386575 A 19990830
Addnl Info: 5944997 Patented; 5783083 Patented; 5639373 Patented
National Class: * 210636000
IPC: * B01D-061/00
CA Abstract No: * 131(02)022926G
Derwent WPI Acc No: * C 97-165077; C 99-356790; C 99-371296; C
00-282502
Language of Document: English

WORLD INTELLECTUAL PROPERTY ORGANIZATION, PCT (WO)
Patent (No,Kind,Date): WO 9929401 A1 19990617
SYSTEM FOR MAINTAINING A CLEAN SKEIN OF HOLLOW FIBRES WHILE FILTERIN
SUSPENDED SOLIDS (English)
Patent Assignee: ZENON ENVIRONMENTAL INC (CA)
Author (Inventor): PEDERSEN STEVEN KRISTIAN; BEHMANN HENRY
Priority (No,Kind,Date): US 67724 P 19971208; US 24417 A 19980217
Applic (No,Kind,Date): WO 98CA1115 A 19981202
Designated States: (National) AU; BR; CA; CZ; HU; JP; KR; MX; PL
(Regional) AT; BE; CH; CY; DE; DK; ES; FI; FR; GB; GR; IE; IT; LU; MC; NL
PT; SE
Filing Details: WO 100000 With international search report
IPC: * B01D-061/18; B01D-063/02; B01D-063/04; B01D-065/02; B01D-065/08
CA Abstract No: * 131(02)022926G; 131(02)022926G
Derwent WPI Acc No: * C 99-371296; C 99-371296
Language of Document: English
Patent (No,Kind,Date): WO 9706880 A2 19970227
VERTICAL SKEIN OF HOLLOW FIBER MEMBRANES AND METHOD OF MAINTAINING CLEA
FIBER SURFACES (English)
Patent Assignee: ZENON ENVIRONMENTAL INC (CA)
Author (Inventor): MAHENDRAN MAILVAGANAM; PEDERSEN STEVEN KRISTIAN; HENSHA
WAYNE JERALD; BEHMANN HENRY; RODRIGUES CARLOS FERNANDO F
Priority (No,Kind,Date): US 514119 A 19950811; US 690045 A 19960731
Applic (No,Kind,Date): WO 96CA536 A 19960808
Designated States: (National) AU; BR; CA; CZ; HU; JP; KR; PL (Regional
AT; BE; CH; DE; DK; ES; FI; FR; GB; GR; IE; IT; LU; MC; NL; PT; SE
Filing Details: WO 300000 Without international search report and to b
republished upon receipt of that report
IPC: * B01D-063/62
Derwent WPI Acc No: * C 97-165077; C 97-165077
Language of Document: English
Patent (No,Kind,Date): WO 9706880 A3 19970501
VERTICAL SKEIN OF HOLLOW FIBER MEMBRANES AND METHOD OF MAINTAINING CLEA
FIBER SURFACES (English)
Patent Assignee: ZENON ENVIRONMENTAL INC (CA)
Author (Inventor): MAHENDRAN MAILVAGANAM; PEDERSEN STEVEN KRISTIAN; HENSHA
WAYNE JERALD; BEHMANN HENRY; RODRIGUES CARLOS FERNANDO F
Priority (No,Kind,Date): US 514119 A 19950811; US 690045 A 19960731
Applic (No,Kind,Date): WO 96CA536 A 19960808
Designated States: (National) AU; BR; CA; CZ; HU; JP; KR; PL (Regional
AT; BE; CH; DE; DK; ES; FI; FR; GB; GR; IE; IT; LU; MC; NL; PT; SE
Filing Details: WO 300000 Without international search report and to b
republished upon receipt of that report
IPC: * B01D-063/62
Derwent WPI Acc No: * C 97-165077; C 99-356790; C 00-282502

Language of Document: English

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3. 1/5/3 (Item 1 from file: 351)

011187152 **Image available**
WPI Acc No: 1997-165077/199715

Multi-component liquid micro-filtration apparatus with surface cleaning - has vertical skeins formed of a number of equal length hollow fibres each end held in headers where air discharged at skein base produces bubbles in quantity large enough to scrub the fibres.

Patent Assignee: ZENON ENVIRONMENTAL INC (ZENO-N)
Inventor: BEHMANN H; HENSHAW W J; MAHENDRAN M; PEDERSEN S K; RODRIGUES C F F

Number of Countries: 027 Number of Patents: 010

Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week
WO 9706880	A2	19970227	WO 96CA536	A	19960808	199715 B
AU 9666528	A	19970312	AU 9666528	A	19960808	199727
US 5639373	A	19970617	US 95514119	A	19950811	199730
WO 9706880	A3	19970501	WO 96CA536	A	19960808	199732
TW 320661	A	19971121	TW 96109723	A	19960810	199811
EP 846023	A2	19980610	EP 96926288	A	19960808	199827
			WO 96CA536	A	19960808	
US 5783083	A	19980721	US 95514119	A	19950811	199836
			US 96690045	A	19960731	
AU 715364	B	20000203	AU 9666528	A	19960808	200016
KR 99036232	A	19990525	WO 96CA536	A	19960808	200032
			KR 98700900	A	19980206	
CA 2227692	C	20010417	CA 2227692	A	19960808	200128
			WO 96CA536	A	19960808	

Priority Applications (No Type Date): US 96690045 A 19960731; US 95514119 A 19950811

Cited Patents: 2.Jnl.Ref; JP 7136470; JP 63143905; WO 9411094

Patent Details:

Patent No Kind Lan Pg Main IPC Filing Notes

WO 9706880 A2 E 78 B01D-063/62

Designated States (National): AU BR CA CZ HU JP KR PL

Designated States (Regional): AT BE CH DE DK ES FI FR GB GR IE IT LU MC NL P

SE
AU 9666528 A B01D-053/62 Based on patent WO 9706880

US 5639373 A 29 B01D-065/02

WO 9706880 A3 B01D-063/62

TW 320661 A D04H-001/02

EP 846023 A2 E B01D-063/02

US 5783083 A B01D-061/00

AU 715364 B B01D-053/62

KR 99036232 A B01D-063/12

CA 2227692 C E B01D-065/02

Abstract (Basic): WO 9706880 A

A micro-filtration appts. has first and second headers vertically space apart at a fixed distance, the lower within the liq. substrate. Each header securely holds one end of a number of hollow fibre membranes each of equal length which is 0.1 to 5% greater than the length between the headers permitting restricted movement of the central fibre portion independent of the movement of another fibre which are subjected to transmembrane pressure differential in the range 0.1 to 50 psi.

Also claimed are: (i) permeate collecting means sealing connected in

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fluid communication with permeate discharge face of each header and a means to withdraw the permeate; (ii) gas scrubbing assembly; (iii) process for maintaining the outer surfaces of the membranes free from build-up; (iv) method of forming a skein; and (v) a header having potted hollow fibre membranes.

USE - Micro filtration of multicomponent liqs., e.g. fruit juices for clarification, waste water, proteinaceous dairy produces i.e. cheese whey, activated sludge etc..

ADVANTAGE - Effectively cleans the filter media which is unstressed overcoming problems of fibre rotating, bunching together and abrading each other as experienced in prior art.

Dwg.9/20

Abstract (Equivalent): US 5639373 A

In a microfiltration membrane device, for withdrawing permeate essentially continuously from a multicomponent liquid substrate while increasing the concentration of particulate material in it, includes: a multiplicity of hollow fibre membranes, or fibres, unconfined in a shell of a module, the fibres together having a surface area $> 1 \text{ m}^2$, the fibres being swayed in the substrate, the fibres being subject to a trans-membrane pressure differential in the range 0.7 kPa (0.1 psi) to 345 kPa (50 psi), and each fibre having a length $> 0.5 \text{ m}$; a first header and a second header disposed in transversely spaced-apart relationship with the second header within the substrate; the first header and the second header having opposed terminal end portions of each fibre sealingly secured in it, all open ends of the fibres extending from a permeate-discharging face of at least one header; permeate collection means to collect the permeate, sealingly connected in open fluid communication with a permeate-discharging face of each of the headers; and, means to withdraw the permeate; the improvement comprising, the fibres, the headers and the permeate collection means together forming a vertical skein where the fibres are essentially vertically disposed and terminal end portions of individual fibres are potted in proximally spaced-apart relationship in cured resin; the first header being upper and disposed vertically spaced-apart relationship above the second header, with the opposed faces at a fixed distance; each of the fibres having the same length, the length being from 0.1% to $> 5\%$ greater than the fixed distance so as to permit restricted displacement of an intermediate portion of each fibre, independently of the movement of another fibre.

Dwg.0/13

Derwent Class: D13; D15; J01

International Patent Class (Main): B01D-053/62; B01D-061/00; B01D-063/02; B01D-063/12; B01D-063/62; B01D-065/02; D04H-001/02

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